

CLAIMS

1. A method for determining a chemotherapeutic regimen for an individual having a primary and metastatic tumor, comprising
 - a) obtaining a mRNA sample from the individual's primary tumor specimen;
 - 5 b) determining a gene expression level for a tumor gene determinant in the primary tumor specimen;
 - c) comparing the gene expression level for the tumor gene determinant with a predetermined threshold value for that tumor gene; and
 - d) providing a chemotherapeutic regimen comprising a chemotherapeutic agent
- 10 appropriate for the tumor gene determinant to treat the individual having a tumor metastases.
2. The method of claim 1 wherein the tumor gene determinant is *EGFR*.
3. The method of claim 1 wherein the tumor gene determinant is *DPD*.
4. The method of claim 1 wherein the tumor gene determinant is *TS*.
- 15 5. The method of claim 1 wherein determining gene expression level comprises a fluorescence based real-time detection method.
6. The method of claim 5 wherein the tumor gene determinant is *EGFR*.
7. The method of claim 5 wherein the tumor gene determinant is *DPD*.

8. The method of claim 5 wherein the tumor gene determinant is *TS*.
9. A method of determining whether a chemotherapeutic regimen comprising a chemotherapeutic agent appropriate for a tumor gene determinant in a primary tumor is appropriate for a tumor metastasis comprising,
- 5 a) obtaining an mRNA sample from the primary tumor,
- b) determining an expression level of the tumor gene determinant,
- c) comparing the expression level of the tumor gene determinant with a predetermined threshold level; and
- d) determining the chemotherapeutic regimen for the tumor metastasis.
- 10 10. The method of claim 9 wherein the tumor gene determinant is *EGFR*.
11. The method of claim 9 wherein the tumor gene determinant is *DPD*.
12. The method of claim 9 wherein the tumor gene determinant is *TS*.
13. A method of determining whether an anti-metabolite, genotoxic, and/or receptor tyrosine kinase targeted gene expression based chemotherapeutic appropriate for treating
- 15 a primary tumor is appropriate for treating a tumor metastasis comprising quantifying an amount of tumor gene determinant mRNA expression in fresh, frozen, fixed or fixed and paraffin-embedded (FPE) tissue relative to gene expression of an internal control in a primary tumor.
14. The method of claim 13 wherein the tumor gene determinant is *DPD*.

15. The method of claim 13 wherein the tumor gene determinant is *TS*.
16. The method of claim 13 wherein the tumor gene determinant is *EGFR*.